

Name:

Solutions

Converting Quadratic Functions from Factored Form to Standard Form $f(x) = ax^2 + bx + c$

1. Convert $A(x) = (x-8)^2 = (x-8)(x-8) = x^2 - 8x - 8x + 64$
 $= x^2 - 16x + 64$

2. Convert $k(x) = (x+1)(x-10) = x^2 - 10x + x - 10 = x^2 - 9x - 10$

3. Convert $m(x) = 2(3x-2)(x-4) = 2(3x^2 - 12x - 2x + 8)$
 $= 2(3x^2 - 14x + 8)$
 $= 6x^2 - 28x + 16$

4. Convert $h(x) = -(3x-5)(2x-1) = -(6x^2 - 3x - 10x + 5)$
 $= -(6x^2 - 13x + 5)$
 $= -6x^2 + 13x - 5$

5. Convert $p(x) = \frac{1}{3}(3x+1)(4x-3) = \frac{1}{3}(12x^2 - 9x + 4x - 3)$
 $= \frac{1}{3}(12x^2 - 5x - 3)$
 $= 4x^2 - \frac{5}{3}x - 1$

Converting Quadratic Functions from Vertex Form $f(x) = a(x-h)^2 + k$ to Standard Form

$$f(x) = ax^2 + bx + c$$

6. Convert $A(x) = (x+1)^2 - 5$ $= (x+1)(x+1) - 5 = x^2 + 2x + 1 - 5$
 $= x^2 + 2x - 4$

7. Convert $f(x) = (3x-2)^2 - 1$ $= (3x-2)(3x-2) - 1 = 9x^2 - 6x - 6x + 4 - 1$
 $= 9x^2 - 12x + 3$

8. Convert $k(x) = -(x+4)^2 - 2$ $= -(x+4)(x+4) - 2$
 $= -(x^2 + 8x + 16) - 2$
 $= -x^2 - 8x - 16 - 2$
 $= -x^2 - 8x - 18$

9. Convert $w(x) = 2(x-5)^2 - 8$ $= 2(x-5)(x-5) - 8$
 $= 2(x^2 - 10x + 25) - 8$
 $= 2x^2 - 20x + 50 - 8$
 $= 2x^2 - 20x + 42$

Converting Quadratic Functions from Standard Form $f(x) = ax^2 + bx + c$ to Factored Form

10. Convert $f(x) = x^2 - 25$ $= (x-5)(x+5)$

11. Convert $g(x) = 1 - x^2 = (1-x)(1+x)$

12. Convert $k(x) = x^2 - 5x = x(x-5)$

13. Convert $p(x) = x^2 - 8x + 16 = (x-4)(x-4) = (x-4)^2$

14. Convert $j(x) = x^2 + 7x + 6 = (x+1)(x+6)$

15. Convert $r(x) = 2x^2 + 6x - 8 = 2(x^2 + 3x - 4) = 2(x+4)(x-1)$

16. Convert $V(x) = 2x^2 - 9x - 35 = (2x+5)(x-7)$

17. Convert $A(x) = x^2 + 4x + 6 = \text{DNF}$

Converting Quadratic Functions from Standard Form to Vertex Form $f(x) = a(x-h)^2 + k$

18. Convert $g(x) = x^2 + 8x - 13$

$$= (x^2 + 8x + 16) - 13 - 16$$
$$= (x + 4)^2 - 29 \quad V(-4, -29)$$

19. Convert $p(x) = x^2 - 6x + 10$

$$= (x^2 - 6x + 9) + 10 - 9$$
$$= (x - 3)^2 + 1 \quad V(3, 1)$$

20. Convert $j(x) = -x^2 + 10x + 5$

$$= -(x^2 - 10x + 25) + 5 + 25 \quad \text{careful}$$
$$= -(x - 5)^2 + 30 \quad V(5, 30)$$

21. Convert $r(x) = 2x^2 - 8x - 8$

$$= 2(x^2 - 4x + 4) - 8 - 8 \quad \text{careful}$$
$$= 2(x - 2)^2 - 16 \quad V(2, -16)$$

22. Convert $V(x) = 2x^2 + 12x - 1$

$$= 2(x^2 + 6x + 9) - 1 - 18 \quad \text{careful}$$
$$= 2(x + 3)^2 - 19 \quad V(-3, -19)$$